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ABSTRACT

Teachers' concern with the "what" of reading has clouded the issue of the "how" of reading. Knowledge of how a child goes about particular reading tasks may give clues to the difficulties he is encountering. Work with disabled readers during three phases of behavior--(1) before the breakthrough in acquiring a reading process, (2) at the time of the breakthrough, and (3) after the breakthrough--provides insight into how a reading process is acquired. From these observations it is hypothesized that learning how to read occurs in moments of "light." As a child instantaneously perceives a concept which has hitherto eluded him, he acquires a new processing method for making the printed symbol meaningful. Examples of times when a child acquires a new processing method are when he first (1) blends sounds into words, (2) groups printed words into meaningful phrases, and (3) comprehends unvocalized thought units. Since these processes can be acquired independently of one another, children differ in how they read. The teacher who subscribes to this theory will be constantly examining the child's performance to determine whether, in relation to the skill being taught, he understands the process, needs more information, or is ready to use and perfect his skill through functional reading. References are included. (DH)

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MIRACLES OF LEARNING

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Experiences with handicapped readers suggest that teachers should be as interested in the "how" of reading as they are in the "what" of reading. Implications of this idea for teaching and examples of activities are given.

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When Helen Keller realized that w -a-t-e-r spelled on her hand symbolized the cool liquid she knew, she didn't learn only one word; she was enabled to unlock the world of all knowledge. Now all the other letters and words she had memorized as meaningless finger play took on meaning, in an instant. She had yet to learn all the other words and their syntactic relations, but she had learned the one enabling lesson.

Anyone who saw "The Miracle Worker" thrilled to that moment of revelation. Because of the long period of frustration and the seemingly insurmountable barriers, the dramatic breakthrough into use of words came as a miracle. No less miraculous is each child's acquisition of the same concept, but because it occurs informally, naturally, when it is expected in the child's development, it may pass unnoticed except by doting parents.

I

Classroom teachers of reading too are unaware of such miracles in the use of print which occur in the course of any sequential reading program because most children acquire the skills and knowledge just as the teacher expected they would. The special reading teacher, however, working with handicapped readers, is privileged to be present at a number of children's moment of insight, which often can be logged to the minute.

Frequently the reading teacher's reports of such occurrences and the immediate change in the pupil's performance are skeptically viewed as as braggadocio or self-delusion. Her colleagues know all too well the hard work of day-to-day teaching needed in their classrooms. Even the

child's regular teacher may be baffled or threatened: "I've been teaching that all along, and he never learned it. How could he learn it all at once?"

Too many teachers meeting such rebuffs quickly learn to keep these experiences to themselves. But what happens at these moments needs to be reported, analyzed, and theorized about, so that whatever is significant in either the child's learning or the teacher's teaching may be shared for the benefit of others.

Even when colleagues become aware that such events do occur, their response may be hard to handle. At least so I found the first time one said to me, "You're magic!" That someone should even think this, meant more was expected of me than I knew I could produce. What was happening then in my six reading classes totally 176 junior high pupils was puzzling to me. I hadn't anticipated their rapid gains in comprehension and rate, and I didn't know what caused them either. So far as I knew, all I was doing was using every single idea in any of the reading texts and teachers' guides available in the school system. My experience could only make me wonder as it has others (/), if so much improvement is made in six weeks what has been going on before and how could the children possibly continue to improve at this rate.

Teachers stopped me in the halls to tell me of average or good students whose reading puzzled them, as though what eluded them would be revealed to me with a magic mirror. When I met their pupil after school, I felt ill equipped to do anything other than listen to him read and then take a guess about what he was trying to do --not about the mistakes that he made, for at that time I had no classification system for analyzing errors.

Perhaps his oral performance prompted the guess: "You're trying to remember what each word is, aren't you, so you can say it?" Or one of these: "You try to sound out each letter, don't you?" "You look at one word and say it and then look at the next don't you?" "You get the meaning of each word, don't you? But you don't get the whole idea."

Or if nothing seemed unusual about the oral reading, his silent reading performance might suggest, "You're hearing every word in your head, aren't you?" "You silently say each word to yourself." Or, "You read the hard parts just as fast as the easy parts, don't you?"

If reading that way caused him difficulty, I'd suggest and he'd try any of the recommendations I had picked up in reading exercises appearing in ordinary classroom reading texts and workbooks. Invariably these children reported to me a week later that they were doing so much better, their grades were going up, or they now felt confident; and they didn't need any more private sessions with me. These reports could have been polite ways of getting out of after-school sessions, but their teachers confirmed them and wanted to know what I did. Since I didn't realize that the crucial element was my guess about how the child tried to read, I could only tell the teachers about exercises they themselves already used with little profit with that particular student.

Only years later did I learn from Dr. D. Lewis Edwards that he had discovered a significant difference between the concept of reading held by poorer readers and by better readers. (2) They are actually trying to do different things. By concentrating on what the children were trying to do and how they found out things, I had been helping children change the way they read, bringing about noticeable improvement in their reading.

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For most of my own pupils I could not pin-point a particular time of improvement, but with segeral children who had severe problems I was at their elbow at the "a-ha" moment.

Seeking to learn more about reading, I enrolled in graduate study, but the experiences I was most interested in and hoped to duplicate more frequently didn't fit into the systematic, developmental pattern of reading growth being taught. Later, as a reading consultant, I continued to see children in grades one through eight get flashes of something I called "insight" which altered their reading attack so that there was instantaneous improvement. Suddenly they could use the lessons taught them in their classroom. They didn't suddenly become better readers, but they now were enabled to become better readers.

First grade children were referred earlier and earlier in the year, for teachers found that a child helped at the first sign of difficulty often could proceed with the regular class instruction. Here too, with the beginning reader as with the older handicapped reader, moments of light or insight, for lack of a word with unique meaning, preceeded dramatic improvement, as when the first-grade repeater who had always rushed through his dictation of experience stories, piling sentence on sentence, suddenly stopped after "I" and when asked, "I--what?" answered, "Write I and then I'll tell you."

I began to wonder if my work with disabled readers wasn't giving me glimpses into the very process of learning how to read. When the learner is successful, there is little empirical evidence as to what happens in the learner's mind. In that case, theories of how reading is learned must rest largely on hypotheses based on educated hunches or on theories of learning

in general.

When, however, a breakdown in the learning process is located and the gap is bridged, the learner's behavior before the breakthrough, at the breakthrough, and after the breakthrough becomes data on which to formulate a more empirically based bypothesis. There was a situation parallel to this in the field of psychotherapy when the study of sick minds gave insight into the development of all minds.

Regardless of their difficulty, my pupils seemed to exhibit a common pattern:

1. A stage of inability or marked inadequacy,
2. A moment of "light,"
3. Immediate improvement in performance, not to be confused with perfection or cure,
4. A period of gradual growth.

Anyone watching a child's first successful encounter with a bicycle observes parallel stages:

1. He can't keep the bicycle in motion,
2. He is able to keep his balance,
3. He rides, however wobbly,
4. He practices.

These steps are exemplified by three of those junior high pupils who simultaneously thrilled and puzzled me:

A seventh-grade boy placed in the lowest of nine sections of ability groups classes reported that because of "reversed vision" in first and second grade, he had missed all the basics. Through the years he had been privately tutored by remedial reading teachers and was currently being taught by a psychologist.

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Behavior before learning. He could not read aloud any two consecutive words in the simplest materials available in his classroom, the third grade Reader's Digest Skill Builders and the third grade level materials in the SRA Reading Laboratory IIIA. He consistently miscalled the most common sight words, with a show of searching his memory for the name of the word. Some errors were substitutions like mother for mon and pony for horse. He could recite phonics rules; he could not apply them. Although he was unable to read any of the stories discussed by the class, he participated intelligently in the discussions as soon as the characters and the situatioh became clear to him.

He came for four pre-school private reading lessons in which he was asked to trace the words he did not know as he slowly pronounced them in the manner demonstrated by the teacher. The four sessions were spaced through a two-week period. None was so long as fifteen minutes.

At the point of learning. Mid-way in the fourth session as he traced the first t in apartment, he sucked in his breath, and ejaculated the word, "Why!" not as a question but as an expression of surprise. He turned to me, smiled, and immediately turned back to the tracing, which he did rapidly.

After the learning. When he missed the next word, I began to write and sound the word for him to trace. I finished only the first two letters, when he pushed my hand away and said the entire word.

In the following private lessons he needed no help in sounding out at least eighty percent of the words in seventh-grade texts. The reading was slow and deliberate. He needed help as he encountered ould in could and would and ight in light and might. He successfully blended multisyllabic

words. A few weeks later his mother, with tears in her eyes, reported that for the first time in his life he was willing to read in front of his sister who was years younger. His progress was significant enough to thrill her, him, and me, but his teachers complained that he could read only a column while others were finishing a three page story!

The second was an eighth-grade girl in an average section who reported that she had always read aloud so well that her teachers had always given her a grade of B in reading, not realizing she could not understand what she read. She wanted help in reading because she was receiving failing grades on all her tests in eighth-grade social studies and science.

Before the learning. Using good phrasing, she read aloud without error a paragraph in an eighth-grade reader. When asked, "What did you read?" she answered, "I don't know." She read the next paragraph silently with the same result. She read one sentence and could remember only that it was about a man. She was instructed to reread the sentence to find out "what about the man." She reported he went to Schenectady. She read the next sentence silently and knew only that it was about a factory. When asked "what about the factory?" she reread the sentence and reported that the man had gone there for a job.

At the point of learning. She read a third sentence and again recalled only the subject. I pronounced only the words, "What about..." when the girl interrupted, "Oh, I get it." She immediately gave the complete thought expressed in the sentence.

After the learning. She read and recited sentence by sentence of the next paragraph and was assigned to read a paragraph at home in the

way she had just learned and return the next morning to recite it. She repeated this performance sixt times. Within two weeks she reported grades of D, D plus, and C on tests in social studies and science, adding that one of the units was "real interesting."

She hadn't become an A student; in fact, at this point, she could not recall a long passage unless she deliberately recited to herself each paragraph before going on to the next. Besides, her oral statement of the passage was punctuated with longer pauses than most teachers would tolerate in classroom recitations. This could not be called a miraculous cure, yet learning had occurred in a moment of insight.

The third pupil was an eighth-grade boy in an average section who was at the same time the slowest reader in the class and the second best in understanding and interpreting what was read.

Before learning. He read orally one-hundred twenty-five words a minute in an eighth-grade reader and accurately reported in his own words all the facts. He read silently at precisely the same rate with equal recall. He reported that if he tried to read fast, he could not understand what he read. To eliminate part of the vocalization, he was told to "hear" only the words in the passage to which I pointed and merely look at the little words between. One paragraph was read in this manner. He commented, "I don't get it." With the percentage of words to be heard increased, he read a second paragraph. He thought he would be willing to be timed using this method, but he still did not think it would work so well as the old method.

At the point of learning. He read two hundred fifty words a minute, announced, "It works," and proceeded to give total recapitulation of the passage.

After the learning. Without my suggestion or knowledge, the boy and a friend timed each other over the weekend, and he reported rates of two hundred fifty to four hundred fifty words a minute depending on what he was reading. He continued to use a fast rate of reading, needing at times a reminder to adjust his rate to the material and always to read for comprehension.

These three experience--which might be dismissed as atypical exceptions--are just the unusual events that scientists should notice, just as Fleming noticed the absence of culture around the bread mold. If one's own experience has not included such, the first barrier is that of disbelief. Merely piling incident upon incident is not then apt to remove it.

Perhaps, however, one more may serve: A sixth-grade girl who could read primers only haltingly made so many errors on the first half of the Wepman Auditory Discrimination Test that the test results had to be considered invalid. When she responded that "bud" and "bug" were the same word, I asked, "Which would you rather have on your dress, a bud or a bug?" She sat silently for several seconds, her wrinkled brow suddenly smoothing out as she replied, "A bud," after which she responded correctly to all but one of the remaining items in the test. She then began to profit from a phonics course; a year and a half later she was reading third grade books.

I could stop at this point, saying, "Here are some data. What do you make of them?" but I'd only be waiting for the inquiry, "What do you make of them?"

II

Trying to account for both the dissimilarity of the patterns before learning and similarity of behavior at the point of learning exhibited by

my pupils, I hypothesize that this pattern is not an unusual one limited to particular children with reading problems, but that it is typical of all learning how to read, although unobserved under ordinary classroom conditions. I hypothesize that:

Learning how to read occurs in moments of "light." The instantaneous learning amounts to a new processing method by which the printed symbols give rise to meaning.

These processing methods are not verbal concepts. It is not knowledge that graphemes represent sounds, for instance, but acting as though they do.

A specific processing method is acquired at a particular moment. An incomplete list of the times when processing methods are acquired includes those when the pupil first

1. Produces sounds to match printed symbols,
2. Blends sounds into words,
3. Associates printed symbols for words with the spoken word,
4. Produces sub-vocal sound in response to printed symbols,
5. Associates printed words with the concepts for which they stand,
6. Groups printed words into meaningful phrases,
7. Groups printed words into sub-vocal meaningful phrases,
8. Associates printed sentences with complete thoughts,
9. Comprehends unvocalized thought units,
10. Analyzes, evaluates, organizes ideas gained from the printed page.

One processing method, i.e., for changing printed symbols into sounds, can be acquired independently of another, i.e., for seeing words as units. Thus, a pupil may sound out each word that he meets letter by letter, without ever recognizing any word as a unit. Another child may recognize words as a whole or not at all, never sounding out letters.

This independence of acquisition of the processing methods occurs even when logically it might be supposed that one skill was dependent upon another. As an example, many bright children read for main ideas although they cannot restate the ideas incorporated in individual sentences.

Consequently, individuals acquire differing combinations of processing methods. It is possible to read or not to read with various patterns of data processing. Consider these additional pupils I have known: A student of I.Q. 130, read, understood, and analyzed what he read, but could not pronounce an unfamiliar word without using a dictionary. Another had no word attack skills but a large sight vocabulary, all of which he vocalized. Another got the general idea but few facts. Yet another read to himself word by word with little if any comprehension.

When a child has acquired one method of processing, he is not automatically an expert in its use or in all its application. For instance, having "realized" symbols are associated with sounds, the reader may need specific information the first time he encounters the letter combination ph. Similarly, having realized the printed word stands for a meaningful concept, the reader may need lessons in dictionary skills when he meets the word ubiquitous in print.

The bicycle rider is not an expert the first time he rides. Neither is the reader an expert the first time he gets meaning from the printed page. He then needs practice until the skill becomes habitual. Perhaps at first he needs practice in exercises, but his greatest practice comes from reading, reading, reading.

Ordinarily, most children acquire these processing methods in the course of any sequential reading program, with the teacher being unaware

of the moment of acquisition, for at that moment the child has learned too few items to be processed to startle anyone with a rapid growth. For example, with the very first phoneme taught, a child may realize that letters have associated sounds, but he must learn all the others. However, when the child has accumulated the items without the process, the later acquisition of the process results in startling improvement. For example, the child who knows all the sounds taught in a phonics course but who never blended isolated sounds, may suddenly be able to blend all phonetically regular words. The performance may be halting, but with practice it rapidly improves.

If a teacher of reading accepts this theory of learning how to read, he will be continuously watching the individual performance of his pupils to determine whether, in relation to the skill being taught, the pupil has

1. Has "caught"on" to the process. (Learning how to read--the process.)
2. Needs specific information, such as in a phonics course, in vocabulary development, or in paragraph analysis. (Learning to read--the raw materials.)
3. Or, is ready to use and perfect his skills and knowledge through functional reading, as a consumer. (Learning while reading--the product.)

If he accepts this, he will have the same things to teach, but knowledge of his goals will change, and with that will change the relative time devoted to tasks he sets for children or helps them set for themselves. Worksheets will be given only to those children who can profit from their use, that is, those who can process print as required but who need specific instruction. These sheets will not be given to those who don't know what is going on, nor to those who already have the skill and the knowledge.

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Need for the teaching and learning of all the skills and knowledge that any adequate reading program should contain will continue; however, while one aspect of reading may be singled out for instructional emphasis at one time, the multiplicity of processes involved will not be forgotten. Whether the sounds and skills should be taught systematically or as needed, in isolated drill or in context, is not germane to the question, and may indeed be the wrong question to ask. The hypothesis here presented is that the foundational acquisitions in the process of learning to read are not items of factual knowledge, necessary as these are, but methods of processing symbols.

The teacher must be alert to detect those children who fail to acquire each processing method and to provide those stimuli which will facilitate its acquisition. In teaching children how to read, the teacher's job is not unlike that of the coach: "Ideally, he should be able to say something which will serve as a cue or stimulus for the right (or nearly right) response on the part of the pupil. This takes a good deal of ingenuity, but some such verbal cues are more successful than others. And if the pupils don't make the kind of movement the teacher expects when he tells them to do something it may not be the pupils' fault but the teacher's for not being able to give the kind of cue that calls out the desired response." (3)

Although the learning of the process occurs in a moment, periods of frustration often preceed it. For example, I worked with one child a year and a half as he learned letter-sound correspondences until he could pronounce most printed words, but he continued to read word by word until I said the right thing to help him change, "You're beating steady time with the words; make a melody instead."

To help those children who have not learned the processing method, the teacher must devise activities requiring the process in its simplest form as it occurs in the act of reading. For instance, the beginning reader must realize that print is speech written down. If he knows this, he may ask what a sign says, ask you to read a story he brings to you, ask you to write down what he says, or pretend to read a book, saying words he has memorized or made up. If he doesn't know this, he may make little or no progress with any reading program that doesn't stress experience charts; he may acquire a sight vocabulary without attaching syntactic meaning, being unable to tell you what he he has read by sight; or he may acquire a sounding technique for calling words, without attaching semantic meaning to them, as though the vocal production of the word were all that is required in reading.

To help this child learn that print is speech written down, notes may be sent to the child and presented in such a way that his curiosity prompts him to ask, "What does it say?" He should participate in group and individual dictation to the teacher, who writes what is said ver batim, not correcting grammar, at least at this level. Labelling objects is not adequate, for isolated words are not language. Also the child may conclude that words are words only when they name an object or person. He may then experience difficulty with "of" and "to" and "the." Using experience charts for the previous class will not serve the purpose. They were experience charts for the previous class; they are texts for this class. The child must see speech being written down.

Sooner or later the teacher will want the pupil to learn to process print critically. If he has acquired this process, he may compare several sources of information, compare what he has read with his own experience,

or want to know an author's bias. Even the beginning reader may ask, "Is that so?" If he fails to process print critically, the pupil may try to prove his point by saying, "The book says so," be easily swayed by propaganda, or accept as authority celebraties speaking outside the field of their expertise. To help the pupil learn this process, the teacher may use a multi-text approach, assign comparison of viewpoints of several authorities in the same field, require student appraisal of selections before studying what the critics say.

For those children who have acquired a particular processing method, the teacher needs to channel the proper data, i.e., reading material, which gives the reader opportunity to use the method at his present state of maturation, at which time the laws of learning associated with improvement of skills and learning of facts are applicable.

Evan when the teacher is unaware that the how and the what of reading differ, some children acquire the processing methods through their own activity. Those who do not engage in the activity until the moment of "light," do not learn the processing method. These children are then limited to rote learning or conscious learning, either of phonics or of whole word forms, or both, and sometimes neither, as an eighth grade pupil studying phonics revealed in a comment to another remedial reader, "Lou, that's what they were talking about in second grade. Remember? I never did know what was going on then."

In any case, these children learn new sounds and new words, new rules, and new facts which will later account for the learning "all at once" which seems so baffling. "Data may be stored indefinitely and remain only a potential for meaning until the self needs them or discovers their pertinence creatively." (4)

In the past, those children whom Gray speaks of as destined to read have learned phonic attacks while being taught by a method the teacher considered as whole-word, and others have learned the whole-word attack while being taught by a phonics methods. These were the children who learned the processing methods by their own activity as they read aloud, as they listened to others, as they read silently.

Ingrid P. Ylisto lists four identifiable steps in the process of learning to read and then states: "It seems reasonable to assume that some children will be found who have not begun the process, some who have progressed part way, and some who have completed the process." (5) The underlying assumption here is that of a linear progression of one thing first, followed by the second, and so on until the process is complete. Such an assumption underlies much of the controversy about methods of teaching reading. In contrast, the author of this paper sees reading as involving numerous processes simultaneously, and concludes, as does Constance McCullough, in another context, "I cannot agree with those who would start with any one part of the reading act and call it a good beginning." (6)

Professor D. G. Elison in an interview about programmed tutoring is quoted as saying: "Sometime during this process the light goes on. For many kids, it's the first time they realize the sentence is saying something to Them. The tutors we have had are warm, concerned people, they become involved, they see that light go on." (7)

Thus, independent investigators report the crucial need for teaching for the moment when "the light goes on," the moment when the pupil acquires a new processing method.

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